

## *Chem Major Variations*

### *Methods for combining the Chemistry major with our other departmental majors and minors*

Note: A dual degree is not the same as a dual major. The dual degree involves the conferral of two separate degrees and also requires the completion of 150 hours of course work, whereas a dual major can (in principle) be completed in 120 hours, the state minimum for a Bachelor's degree.

Still to come: pre-pharmacy

## Basic Chem Major

Basic Chem Major							
First Year				Second Year			
Fall		Spring		Fall		Spring	
Course	Credits	Course	Credits	Course	Credits	Course	Credits
ENG111	3	ENG112	3	CHE219	3	CHE220	3
CHE 101	3	CHE102	3	CHE219L	1	CHE220L	1
CHE101L	1	CHE102L	1	PHY101	3	PHY102	3
MAT125	4	MAT126	4	PHY101L	1	PHY102L	1
CSC161	3	PSY101	3	MAT202	4	SOC101	3
				PHI201	3	HIS103	3
						ECO202	3
<b>Total</b>	<b>14</b>	<b>Total</b>	<b>14</b>	<b>Total</b>	<b>15</b>	<b>Total</b>	<b>17</b>
<b>Progress</b>	<b>14</b>	<b>Progress</b>	<b>28</b>	<b>Progress</b>	<b>43</b>	<b>Progress</b>	<b>60</b>
Third Year				Fourth Year			
Fall		Spring		Fall		Spring	
Course	Credits	Course	Credits	Course	Credits	Course	Credits
P Chem 1	3	P Chem II	3	Instr Analysis	4	Spectroscopy	3
Anal Chem	4	P Chem Lab	2	Intro Research	3	Humanities Elect	3
Biochem	3	Inorganic Chem	3	Core Elective	3	Core Elective	3
Biochem Lab	1	Humanities Elect	3	Humanities Elect	3	Free Elective	3
Humanities Elect	3	Humanities Elect	3	Free Elective	3	Free Elective	3
Core Elective	3						
<b>Total</b>	<b>17</b>	<b>Total</b>	<b>14</b>	<b>Total</b>	<b>16</b>	<b>Total</b>	<b>15</b>
<b>Progress</b>	<b>77</b>	<b>Progress</b>	<b>91</b>	<b>Progress</b>	<b>107</b>	<b>Progress</b>	<b>122</b>

## Chem Major w Bio Minor

First Year				Second Year			
Fall		Spring		Fall		Spring	
Course	Credits	Course	Credits	Course	Credits	Course	Credits
ENG111	3	ENG112	3	CHE219	3	CHE220	3
CHE 101	3	CHE102	3	CHE219L	1	CHE220L	1
CHE101L	1	CHE102L	1	PHY101	3	PHY102	3
MAT125	4	MAT126	4	PHY101L	1	PHY102L	1
BIO101	3	BIO 102	3	MAT202	4	SOC101	3
BIO 101L	1	BIO 102L	1	PHI201	3	CSC161	3
						ECO202	3
<b>Total</b>	<b>15</b>	<b>Total</b>	<b>15</b>	<b>Total</b>	<b>15</b>	<b>Total</b>	<b>17</b>
<b>Progress</b>	<b>15</b>	<b>Progress</b>	<b>30</b>	<b>Progress</b>	<b>45</b>	<b>Progress</b>	<b>62</b>
Third Year				Fourth Year			
Fall		Spring		Fall		Spring	
Course	Credits	Course	Credits	Course	Credits	Course	Credits
P Chem 1	3	P Chem II	3	Instr Analysis	4	Spectroscopy	3
Anal Chem	4	P Chem Lab	2	Intro Research	3	Humanities Elect	3
Biochem	3	Inorganic Chem	3	Bio Elective	3	Bio Elective	4
Biochem Lab	1	Humanities Elect	3	Humanities Elect	3	PSY101	3
Humanities Elect	3	Humanities Elect	3	Free Elective	3		
HIS103	3						
<b>Total</b>	<b>17</b>	<b>Total</b>	<b>14</b>	<b>Total</b>	<b>16</b>	<b>Total</b>	<b>13</b>
<b>Progress</b>	<b>79</b>	<b>Progress</b>	<b>93</b>	<b>Progress</b>	<b>109</b>	<b>Progress</b>	<b>122</b>

## Chem Major w Bio Dual Major

Chem Major w Bio Dual Major							
First Year				Second Year			
Fall		Spring		Fall		Spring	
Course	Credits	Course	Credits	Course	Credits	Course	Credits
ENG111	3	ENG112	3	CHE219	3	CHE220	3
CHE 101	3	CHE102	3	CHE219L	1	CHE220L	1
CHE101L	1	CHE102L	1	PHY101	3	PHY102	3
MAT125	4	MAT126	4	PHY101L	1	PHY102L	1
BIO101	3	BIO 102	3	MAT202	4	SOC101	3
BIO 101L	1	BIO 102L	1	PHI201	3	CSC161	3
						ECO202	3
<b>Total</b>	<b>15</b>	<b>Total</b>	<b>15</b>	<b>Total</b>	<b>15</b>	<b>Total</b>	<b>17</b>
<b>Progress</b>	<b>15</b>	<b>Progress</b>	<b>30</b>	<b>Progress</b>	<b>45</b>	<b>Progress</b>	<b>62</b>
Third Year				Fourth Year			
Fall		Spring		Fall		Spring	
Course	Credits	Course	Credits	Course	Credits	Course	Credits
P Chem 1	3	P Chem II	3	Instr Analysis	4	Spectroscopy	3
Anal Chem	4	P Chem Lab	2	PSY101	3	Humanities Elect	3
Biochem	3	Inorganic Chem	3	Bio Elective	3	Bio Elective	4
Biochem Lab	1	Humanities Elect	3	Humanities Elect	3	Cell Biology	4
Humanities Elect	3	Humanities Elect	3	Genetics	4		
HIS103	3	Bio Elective	3				
<b>Total</b>	<b>17</b>	<b>Total</b>	<b>17</b>	<b>Total</b>	<b>17</b>	<b>Total</b>	<b>14</b>
<b>Progress</b>	<b>79</b>	<b>Progress</b>	<b>96</b>	<b>Progress</b>	<b>113</b>	<b>Progress</b>	<b>127</b>
<b>Summer</b>		BIO107/108 with Labs		8 credits		<b>Total</b>	<b>8</b>
						<b>Progress</b>	<b>135</b>

## Chem Major w Bio Dual Degree

Chem Major w Bio Dual Degree							
First Year				Second Year			
Fall		Spring		Fall		Spring	
Course	Credits	Course	Credits	Course	Credits	Course	Credits
ENG111	3	ENG112	3	CHE219	3	CHE220	3
CHE 101	3	CHE102	3	CHE219L	1	CHE220L	1
CHE101L	1	CHE102L	1	PHY101	3	PHY102	3
MAT125	4	MAT126	4	PHY101L	1	PHY102L	1
BIO101	3	BIO 102	3	MAT202	4	SOC101	3
BIO 101L	1	BIO 102L	1	PHI201	3	CSC161	3
						ECO202	3
<b>Total</b>	<b>15</b>	<b>Total</b>	<b>15</b>	<b>Total</b>	<b>15</b>	<b>Total</b>	<b>17</b>
<b>Progress</b>	<b>15</b>	<b>Progress</b>	<b>30</b>	<b>Progress</b>	<b>45</b>	<b>Progress</b>	<b>62</b>
Third Year				Fourth Year			
Fall		Spring		Fall		Spring	
Course	Credits	Course	Credits	Course	Credits	Course	Credits
P Chem 1	3	P Chem II	3	Instr Analysis	4	Spectroscopy	3
Anal Chem	4	P Chem Lab	2	Research	3	Humanities Elect	3
Biochem	3	Inorganic Chem	3	Core Elective	3	Bio Elective	4
Biochem Lab	1	Humanities Elect	3	Humanities Elect	3	Cell Biology	4
Humanities Elect	3	Humanities Elect	3	Genetics	4		
HIS103	3	Bio Elective	3				
<b>Total</b>	<b>17</b>	<b>Total</b>	<b>17</b>	<b>Total</b>	<b>17</b>	<b>Total</b>	<b>14</b>
<b>Progress</b>	<b>79</b>	<b>Progress</b>	<b>96</b>	<b>Progress</b>	<b>113</b>	<b>Progress</b>	<b>127</b>
Summer				Semester 9 Fall			
Course	Credits		Course	Credits			
BIO107/108 with Labs	8 credits		PSY101	3			
			Research	3			
			Bio Elective	3			
			Core Elective	3			
			Core Elective	3			
	<b>Total</b>	<b>8</b>		<b>Total</b>	<b>15</b>		
	<b>Progress</b>	<b>135</b>		<b>Progress</b>	<b>150</b>		

## Chem Major w Math Minor

First Year				Second Year			
Fall		Spring		Fall		Spring	
Course	Credits	Course	Credits	Course	Credits	Course	Credits
ENG111	3	ENG112	3	CHE219	3	CHE220	3
CHE 101	3	CHE102	3	CHE219L	1	CHE220L	1
CHE101L	1	CHE102L	1	PHY101	3	PHY102	3
MAT125	4	MAT126	4	PHY101L	1	PHY102L	1
CSC161	3	PSY101	3	MAT202	4	SOC101	3
			1	PHI201	3	HIS103	3
						ECO202	3
<b>Total</b>	<b>14</b>	<b>Total</b>	<b>14</b>	<b>Total</b>	<b>15</b>	<b>Total</b>	<b>17</b>
<b>Progress</b>	<b>14</b>	<b>Progress</b>	<b>28</b>	<b>Progress</b>	<b>43</b>	<b>Progress</b>	<b>60</b>
Third Year				Fourth Year			
Fall		Spring		Fall		Spring	
Course	Credits	Course	Credits	Course	Credits	Course	Credits
P Chem 1	3	P Chem II	3	Instr Analysis	4	Spectroscopy	3
Anal Chem	4	P Chem Lab	2	Intro Research	3	Humanities Elect	3
Biochem	3	Inorganic Chem	3	Free Elective	3	Core Elective	3
Biochem Lab	1	Humanities Elect	3	Math 300/400 EI	3	Core Elective	3
Humanities Elect	3	Humanities Elect	3	Humanities Elect	3	Free Elective	3
Math 300/400 EI	3						
<b>Total</b>	<b>17</b>	<b>Total</b>	<b>14</b>	<b>Total</b>	<b>16</b>	<b>Total</b>	<b>15</b>
<b>Progress</b>	<b>77</b>	<b>Progress</b>	<b>91</b>	<b>Progress</b>	<b>107</b>	<b>Progress</b>	<b>122</b>

## Chem Major w Math Dual Major

Chem Major w Math Dual Major							
First Year				Second Year			
Fall		Spring		Fall		Spring	
Course	Credits	Course	Credits	Course	Credits	Course	Credits
ENG111	3	ENG112	3	CHE219	3	CHE220	3
CHE 101	3	CHE102	3	CHE219L	1	CHE220L	1
CHE101L	1	CHE102L	1	PHY101	3	PHY102	3
MAT125	4	MAT126	4	PHY101L	1	PHY102L	1
CSC161	3	PSY101	3	MAT202	4	SOC101	3
		ECO202	3	PHI201	3	Diff Equations	3
<b>Total</b>	<b>14</b>	<b>Total</b>	<b>17</b>	<b>Total</b>	<b>15</b>	<b>Total</b>	<b>14</b>
<b>Progress</b>	<b>15</b>	<b>Progress</b>	<b>31</b>	<b>Progress</b>	<b>46</b>	<b>Progress</b>	<b>60</b>
Third Year				Fourth Year			
Fall		Spring		Fall		Spring	
Course	Credits	Course	Credits	Course	Credits	Course	Credits
P Chem 1	3	P Chem II	3	Instr Analysis	4	Spectroscopy	3
Anal Chem	4	P Chem Lab	2	Abstract Algebra I	3	Humanities Elect	3
Biochem	3	Inorganic Chem	3	HIS103	3	Discrete Math	3
Biochem Lab	1	Humanities Elect	3	Humanities Elect	3	Real Anal II	3
Humanities Elect	3	Humanities Elect	3	Real Anal I	3	Probability	3
Linear Algebra	3	Math Reasoning	3				
<b>Total</b>	<b>17</b>	<b>Total</b>	<b>17</b>	<b>Total</b>	<b>16</b>	<b>Total</b>	<b>15</b>
<b>Progress</b>	<b>77</b>	<b>Progress</b>	<b>94</b>	<b>Progress</b>	<b>110</b>	<b>Progress</b>	<b>125</b>



## Bio Majors: How near are you to a chem major?

### Bio BS

### Bio BA

#### Chem Courses Needed

#### Fall

Course	Title	Credits	Course	Title	Credits
CHE311	Physical Chemistry I	3	CHE220	Organic II	3
CHE312	Physical Chemistry II	3	CHE220L	Organic II Lab	1
CHE313L	Physical Chemistry Lab	2	CHE311	Physical Chemistry I	3
CHE331	Analytical Chemistry	4	CHE312	Physical Chemistry II	3
CHE332	Instrumental Analysis	4	CHE313L	Physical Chemistry Lab	2
CHE401	Inorganic Chemistry	3	CHE331	Analytical Chemistry	4
CHE412 or 421	Spectroscopy or Organometallics	3	CHE332	Instrumental Analysis	4
			CHE401	Inorganic Chemistry	3
			CHE412 or 421	Spectroscopy or Organometallics	3
<b>Chem Total</b>		<b>22</b>	<b>Chem Total</b>		<b>26</b>

#### Math Courses Needed

#### Math & Physics Needed

Course	Title	Credits	Course	Title	Credits
MAT202	3	3	PHY101	Calculus Physics I	3
			PHY101L	Lab for PHY101	1
			PHY102	Calculus Physics II	3
			PHY102L	Lab for PHY102	1
			MAT125	Calculus I	4
			MAT126	Calculus II	4
			MAT202	Calculus III	4
<b>Math Total</b>		<b>3</b>	<b>Math &amp; Phys Total</b>		<b>20</b>
<b>Grand Total</b>		<b>25</b>	<b>Grand Total</b>		<b>46</b>

### *Please Note:*

These are estimates for a student who has fulfilled all the Biology major requirements (BS or BA).

Your numbers may be better or worse depending on how many courses outside the minimum for your major you have taken. If, for example, you are a candidate for a BIO BS degree, and you have taken Spectroscopy and Calc III, you will need only 19 additional credits to obtain it. Note also that all core requirements must be met in addition to biology requirements

Finally, please note that there is a distinction between a dual major and a dual degree. The first is a single degree with two declared major fields, and the second is the conferral of two separate degrees. The second requires an aggregate minimum of 150 credit hours, whereas the first (the dual major) can be conferred for as few as the state minimum for a Bachelor's degree, viz., 120 credit hours.

Bio Majors: How near are you to a chem major?

### Chemistry Needed

Course #	Course	Credits
CHE219	Organic I	1
CHE220	Organic II	3
CHE219L	Organic I Lab	1
CHE220L	Organic II Lab	1
CHE311	Physical Chemistry I	3
CHE312	Physical Chemistry II	3
CHE313L	Physical Chemistry Lab	2
CHE331	Analytical Chemistry	4
CHE332	Instrumental Analysis	4
CHE401	Inorganic Chemistry	3
CHE412 or 421	Spectroscopy or Organometallics	3
<b>Chem Total</b>		<b>28</b>
Minus the seven credit core requirement		<b>(7)</b>
<b>Total Credits Above the Major Requirement</b>		<b>21</b>

### Math & Physics Needed

Course #	Course	Credits
Guess what--you take them all as part of your major		<b>0</b>
<b>Math &amp; Phys Total</b>		<b>0</b>
<b>Grand Total</b>		<b>21</b>

Please Note:

These are estimates for a student who has fulfilled all the Math major requirements .

Your numbers may be better or worse depending on how many courses outside the minimum for your major you have taken. Note also that all core requirements must be met in addition to math requirements, but that your core requirement for two sciences above and beyond physics can be fulfilled by some of the extra chemistry classes you are taking.

Finally, please note that there is a distinction between a dual major and a dual degree. The first is a single degree with two declared major fields, and the second is the conferral of two separate degrees. The second requires an aggregate minimum of 150 credit hours, whereas the first (the dual major) can be conferred for as few as the state minimum for a Bachelor's degree, viz., 120 credit hours.